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CONCRETE BUILDINGS *and their* ARCHITECTURAL POSSIBILITIES

Compiled by ALBERT MOYER



Vulcanite Portland
Cement Co.

PHILADELPHIA
& NEW YORK

Main Sales Office:

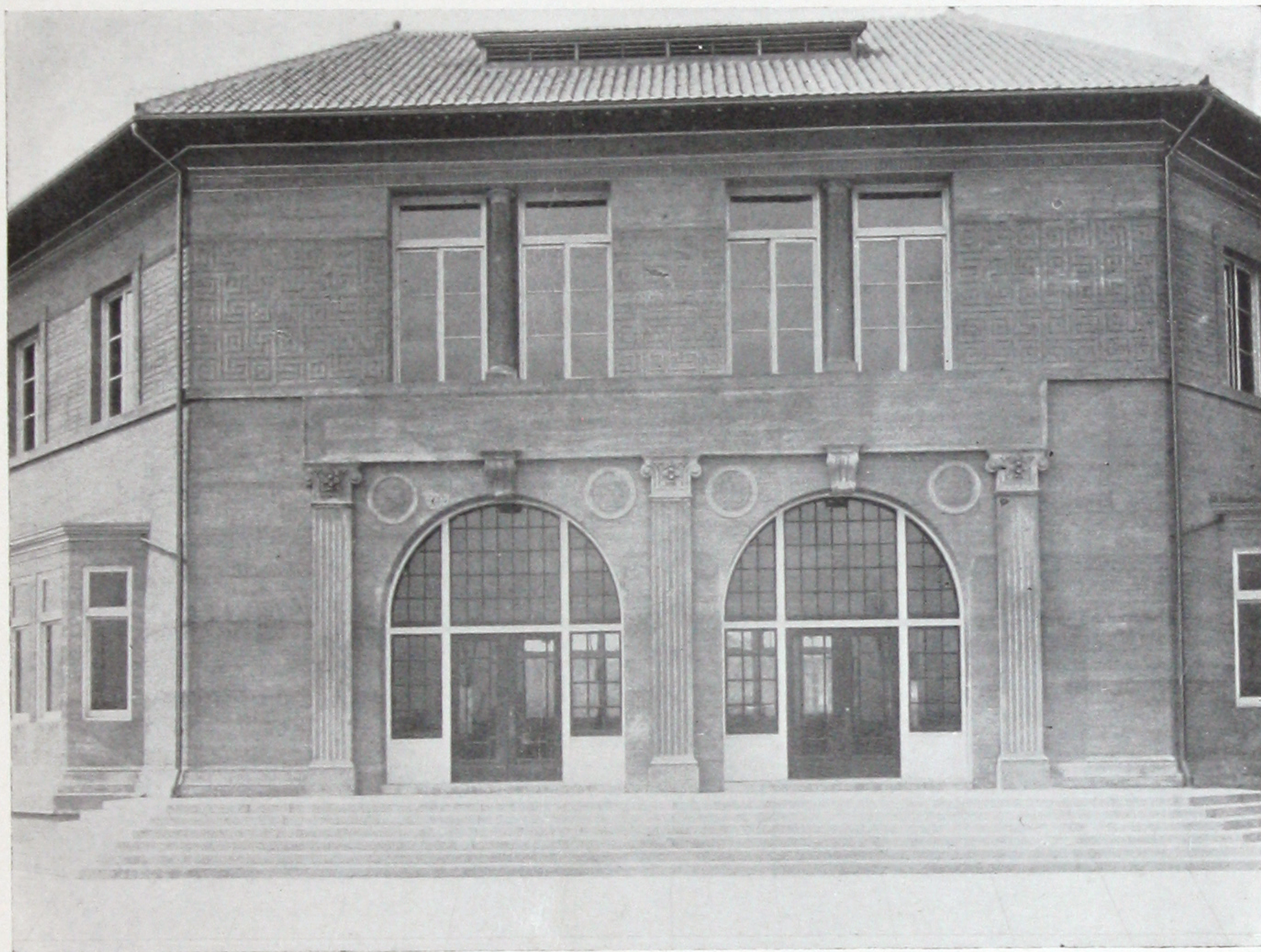
"Flatiron" Building
NEW YORK





CONCRETE BUILDINGS —AND THEIR— ARCHITECTURAL POSSIBILITIES

BY ALBERT MOYER



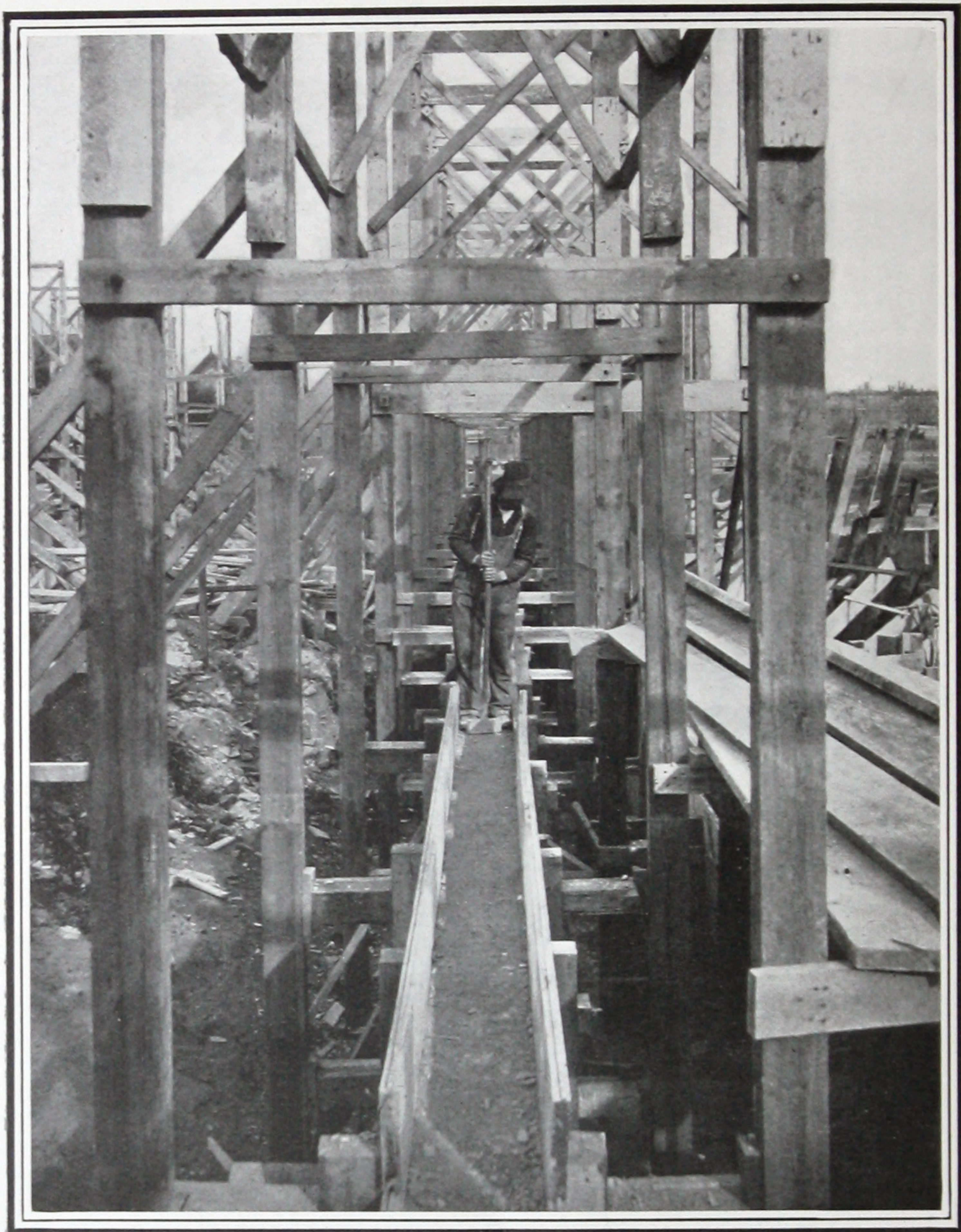
Main Entrance Main Building, showing detail of ornamentation, all of
Portland Cement Concrete.

D. H. BURNHAM & CO.,
Architects.

PORTLAND CEMENT,
"Vulcanite" Brand.

RUDOLPH S. BLOME CO
Contractors.





Detail of the Method of Forms Employed and
Tamping Concrete.


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CONCRETE BUILDINGS

AND THEIR

ARCHITECTURAL

POSSIBILITIES

ONCRETE CONSTRUCTION is attracting the attention of architects pretty much all over the world, in fact the enormous increase in the use of Portland Cement has caused the present period to be styled "*The Cement Age.*" Very little information of a definite sort has been published on the possibilities of Cement Construction, applied architecturally.

A building erected of Portland Cement Concrete should not be an imitation of any other material. The architectural possibilities of Cement Concrete as a definite and original form of construction are almost unlimited.

The purpose of this pamphlet is to bring to the attention of architects an example of one of the forms of Concrete Building Construction which is unique in that there is no finish as popularly termed to the outside of the walls. Attention is called to the appearance of these walls; no effort has been made to imitate any other material, it is an example of honest Concrete work and shows the possibility of producing beautiful though simple architectural effects. The Concrete is left rough, and a most beautiful, artistic result produced, an effect which might be described as a rough regularity of design and color. The illustration which we shall use is that of the Recreation or Field House Buildings erected by the South Park Commission of Chicago at Park No. 3. The South Park system of Chicago has, during the

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Bird's Eye View of the General Arrangement of the Form or False Work.

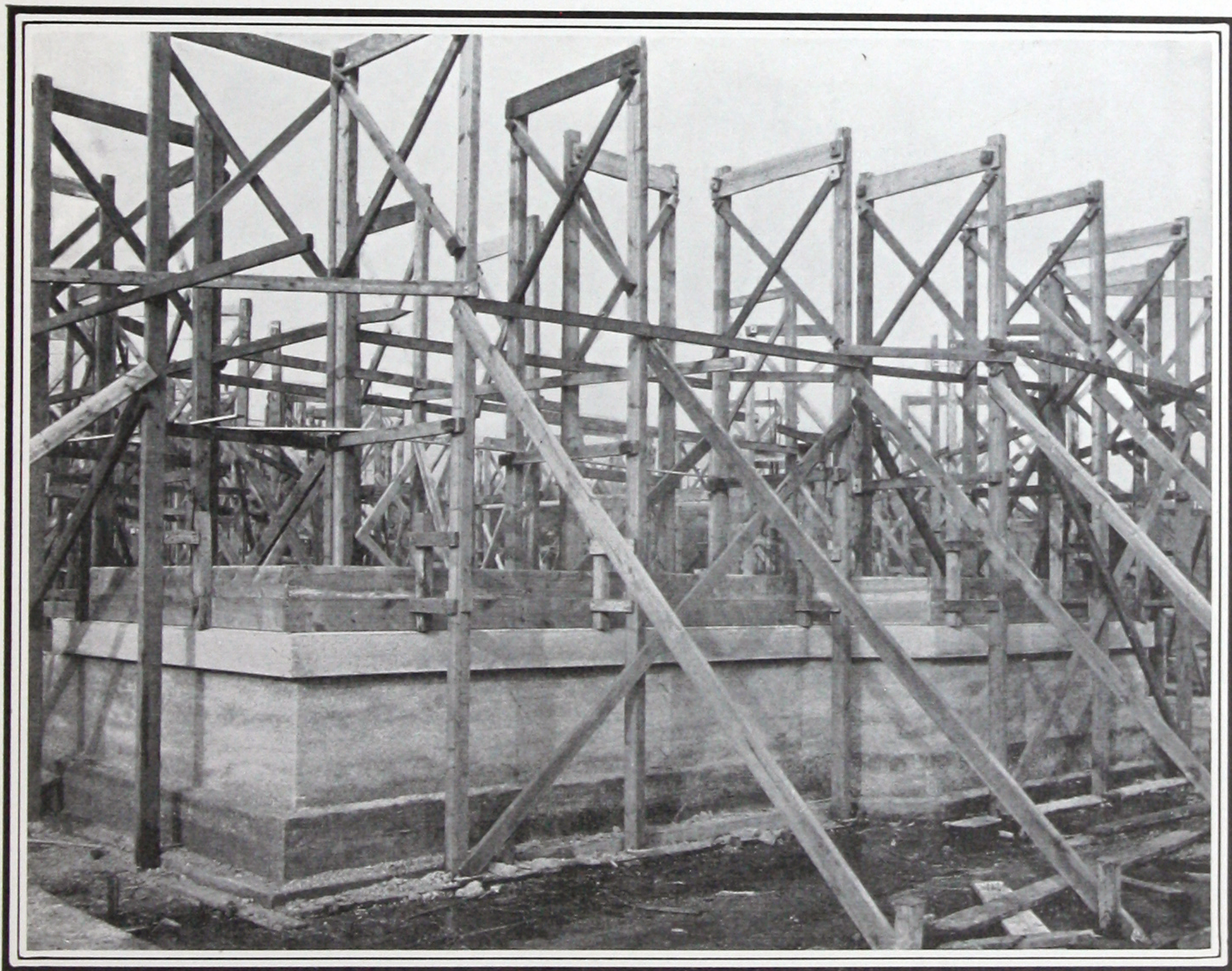
past two years, purchased numerous sites for small parks in the thickly populated sections of the South Side for the purpose of affording that part of the public living a considerable distance from the large parks, a more frequent opportunity for recreation and outdoor amusements.

On these sites are being constructed Field Houses or neighborhood Assembly Buildings, consisting of a Main or Assembly Hall, Men's and Women's Gymnasiums, Plunges, Swimming Pools, Wading Pools for children, Boiler House, etc.

The rapidly increasing application of Concrete for building construction, and the amply demonstrated practicability and durability of Cement Concrete, and the fact that this material is peculiarly adapted for such structures induced the South Park Commissioners to contract for buildings to be erected by this method at some eleven or twelve different parks.

The first contract was awarded to Rudolph S. Blome Company, Chicago, the well-known Concrete Contractors, who have now completed eight of these buildings, an examination of which will convince the most sceptical. These buildings are erected entirely of Concrete including the walls, columns, partitions, lockers, conduits, swimming pools, wading pools, walks, steps, railings, etc. The accompanying views will show as clearly as possible by means of the photograph the method employed in construction and the architectural effect produced.

MATERIALS:—To determine the most satisfactory materials for the aggregate, it was found, after numerous experiments had been made, that to produce the uniformity of color desired, and for compactness, a mixture of crushed lime stone screenings free from dust, but of fine particles, and $\frac{1}{4}$ " crushed stone together with a



A Close View of Corner Construction.



Side View of Main Building.

D. H. BURNHAM & CO.,
Architects.

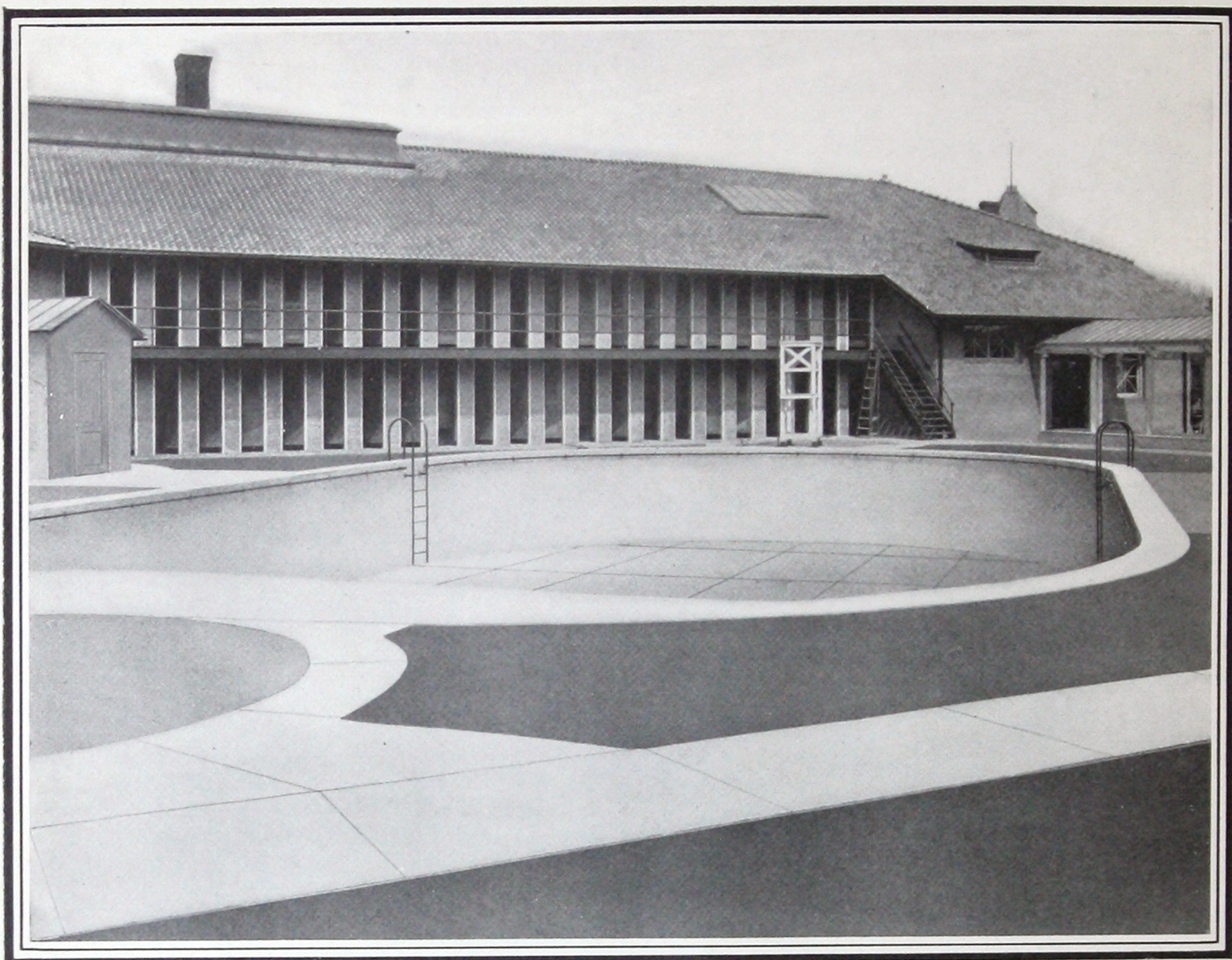
PORTLAND CEMENT,
"Vulcanite" Brand.

RUDOLPH S. BLOME CO.,
Contractors.

certain proportion of coarser crushed stone not over $\frac{1}{2}$ " size, brought about the best results; no sand whatever was used. The Concrete was mixed in the proportion of one part Vulcanite Portland Cement, two parts lime stone screenings, four parts $\frac{1}{2}$ " and $\frac{1}{4}$ " crushed good hard lime stone. No mortar facing was placed against the forms, and, as the Concrete was mixed medium dry, very few board marks were visible. The Concrete was carefully tamped, and made uniformly compact.

WALLS:—The walls for the one story buildings were nine inches thick, for the two story buildings thirteen inches thick, of solid or monolithic Concrete, no plastering on either inside or outside, and no finish whatever excepting that resulting from careful tamping of a well mixed Concrete as described above.

ARCHITECTURAL EFFECTS:—The plainer ornamental effects such as water table projections, sills and caps, cornice, ornamentation in the face of walls at the top, such as the two top ornamental courses, were produced by means of wood negatives mounted inside the forms. The ornamental pilasters, caps and base, keystones, rosettes, etc., were cast separately in plaster moulds; after being set in proper position the adjoining Concrete was worked up against them. The Concrete was mixed fairly dry for the following reasons: In cases where the Concrete is to be subjected to considerable compression and tensile strain, it is desirable to use fairly wet Concrete, but in the case of the buildings which we have described, where no plastering was applied to the work, a uniformity of color and appearance was of greater object; a wet mixture would have been out of the question, as the mortar would have run down the face of the walls in streaks, and possibly considerable efflorescence would have occurred. What is meant by "fairly dry Concrete," is that only enough water was used to permit of thoroughly compacting the Concrete in the forms or moulds without causing oozing of mortar; the color effect of the Concrete relieved by ornamentation and also the



INTERIOR COURT.

Swimming Pool, Cement Walks, Locker Arrangement and Construction,
all of Portland Cement Concrete.

tiled roofing is an unexpectedly pleasant one. The Concrete is so compact, the color so uniform, and the surface of a grainy appearance that the effect is somewhat like Bedford Stone with the exception that it is not as smooth and is not lined off to imitate sections of stone. The tiled roofing is of mottled green old fashioned tiles which together with the beautiful color of Concrete, make a very excellent color effect. We believe that the photographic views will quite clearly show the system of carpentry or form work employed. The inner face of the forms or moulds were planed and matched; the up-rights, or bracing timbers were erected full height; the Concrete was dumped into these moulds, each batch being carried up to a height of about four feet six inches and thoroughly tamped before the next batch was thrown in.

FLOORS :—The greater part of the floors are finished cement laid on ground, there are also some wood floors, principally in the second story, and plain Concrete arched floor without reinforcements in the Boiler Room.

SWIMMING POOLS :—The swimming pools are constructed in rather an unusual manner as follows : An exterior six-inch Concrete surrounding wall was built, and a twelve-inch thick Concrete bottom laid. Over this was placed one inch of rock asphalt both on the bottom, and vertically on the walls. Then another six-inch wall and six-inch bottom laid over the rock asphalt. Then a horizontal and vertical course of one-inch thick asphalt and finally still another six-inch thick wall and bottom floor, both of which were with cement finished surfaces. While this was a more or less costly construction, the result has justified the expense, the pool being absolutely water-proof, and will probably remain so for all time to come.

WATER-PROOFING OF BUILDINGS :—As the first floor level of the building is some four feet above the sidewalk level, and as the Concrete is very dense, no water-proofing was found to be

necessary. There are no basements except in the Boiler Room where no water was encountered, making unnecessary any special waterproofing except a coat of cement mortar outside of the basement Boiler Room walls.

INTERIOR :—As the interior faces of the wall present a uniform grainy appearance the same as the outside faces, the interior was finished simply by calsomine in various tints, no plastering was done anywhere.

PORTLAND CEMENT :—Several thousand barrels of Vulcanite Portland Cement were used for the set of buildings which we describe and the same brand is also being used for the other buildings now being erected by R. S. Blome Company.

Comparison is invited between these buildings and some others now being erected in Chicago in which other brands of cement are being used.

ALBERT MOYER.

PORTLAND CEMENT ADAPTED TO THE FINER USES.

SOME ten years ago, or even less, Portland Cement was used principally in place of Rosendale and Lime, its application being confined almost entirely to mortar, used in brick and stone masonry. Some little rough concreting was done, but of a rather inferior character. The finer uses such as the manufacture of litho-lite, artificial stone in its various forms, reinforced and monolithic finished Concrete were only in their experimental stages. During the last three to five years enormous strides have been made in this direction largely due to improvements made in the manufacture of Portland Cement. Vulcanite was one of, if not the first mill to attempt to make a special grade which would not only displace the high grade German cements for sidewalk paving, but also due to its sand carrying capacity, strength and uniformity of color, form and appearance, giving it distinctive qualities making it particularly adapted for the class of Concrete construction which was then only in its experimental stage.

Vulcanite Portland Cement differs from other Portland Cements in the care with which it is prepared, the high development of the details of manufacture and the systematic course of selection and inspection which it undergoes at every step of the process. The raw material used is of the best cement rock (argillaceous lime stone) obtainable in the United States, containing a very small percentage of magnesia and practically no trace of any other element which would have other than a beneficial effect. Instead of using steam shovels as is the practice of so many mills, Vulcanite Rock is selected in the quarry by hand, the inferior rock being thrown away. The selected rock is stored in a stone house in piles, each pile carefully analyzed before crushing. A small percentage of pure carbonate of lime stone is then added to each separate pile in order to bring the whole to a correct chemical formula. These piles are then conveyed to the crushers, thence to the dryers, and from the dryers to the mills where the rock is ground to an impalpable powder. This powdered raw material is then analyzed before burning, furnishing a check against the analysis of the rock. This powder is then burned in rotary kilns maintained at an intense heat of uniform temperature. The resulting clinker is analyzed so as to furnish a check against the burning.

From kilns, the clinker goes into large tank-like coolers where it is cooled by blasts of cold air. It is then conveyed to the clinker storage house where it is hydrated, and then is taken to the finishing mills which pulverize it into Portland Cement. After being ground to the required degree of fineness (namely twenty per cent. residue on

a sieve containing 40,000 meshes to the square inch) it is conveyed to the storehouse where it is cooled and fully hydrated before shipment.

The cement in each bin is then analyzed, and also tested for all its physical properties, such as initial and final set, soundness and tensile strength. As each car is loaded, four samples are taken during the loading. These samples are further tested so that not a barrel of Vulcanite Portland Cement leaves our Works which is not of the best that science can produce. The great strength, absolute soundness, standing boiling tests and all tests prescribed by the American Society of Civil Engineers, the uniformity of set and color can leave no doubt in the mind of the experienced user of cement as to the justice of admitting that Vulcanite has these distinctive qualities making it a special grade of Portland Cement.

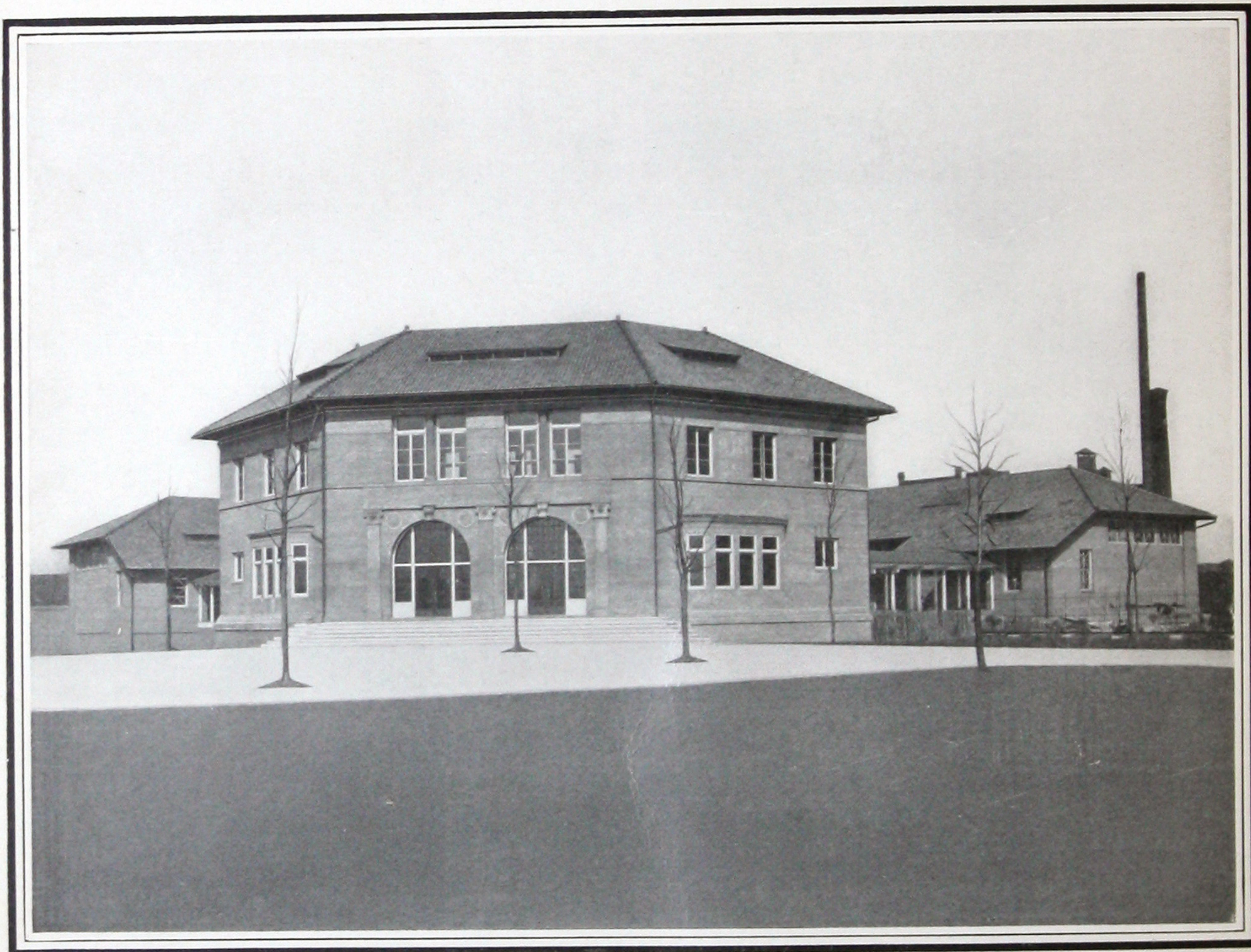
ALBERT MOYER,

Manager of Sales Department.

VULCANITE PORTLAND CEMENT CO.,

FLATIRON BUILDING,
NEW YORK CITY.

JUNE 1ST, 1905.

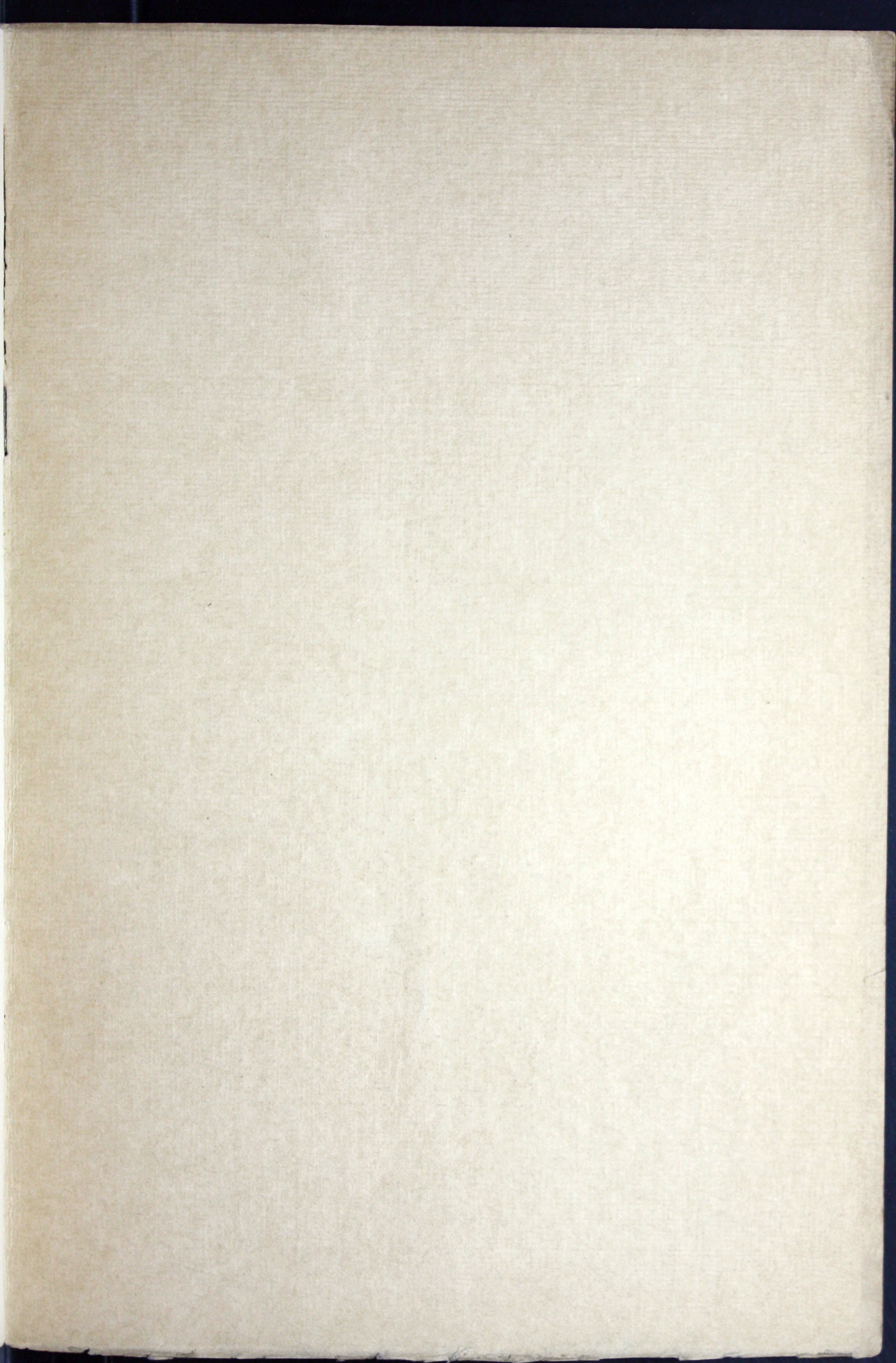


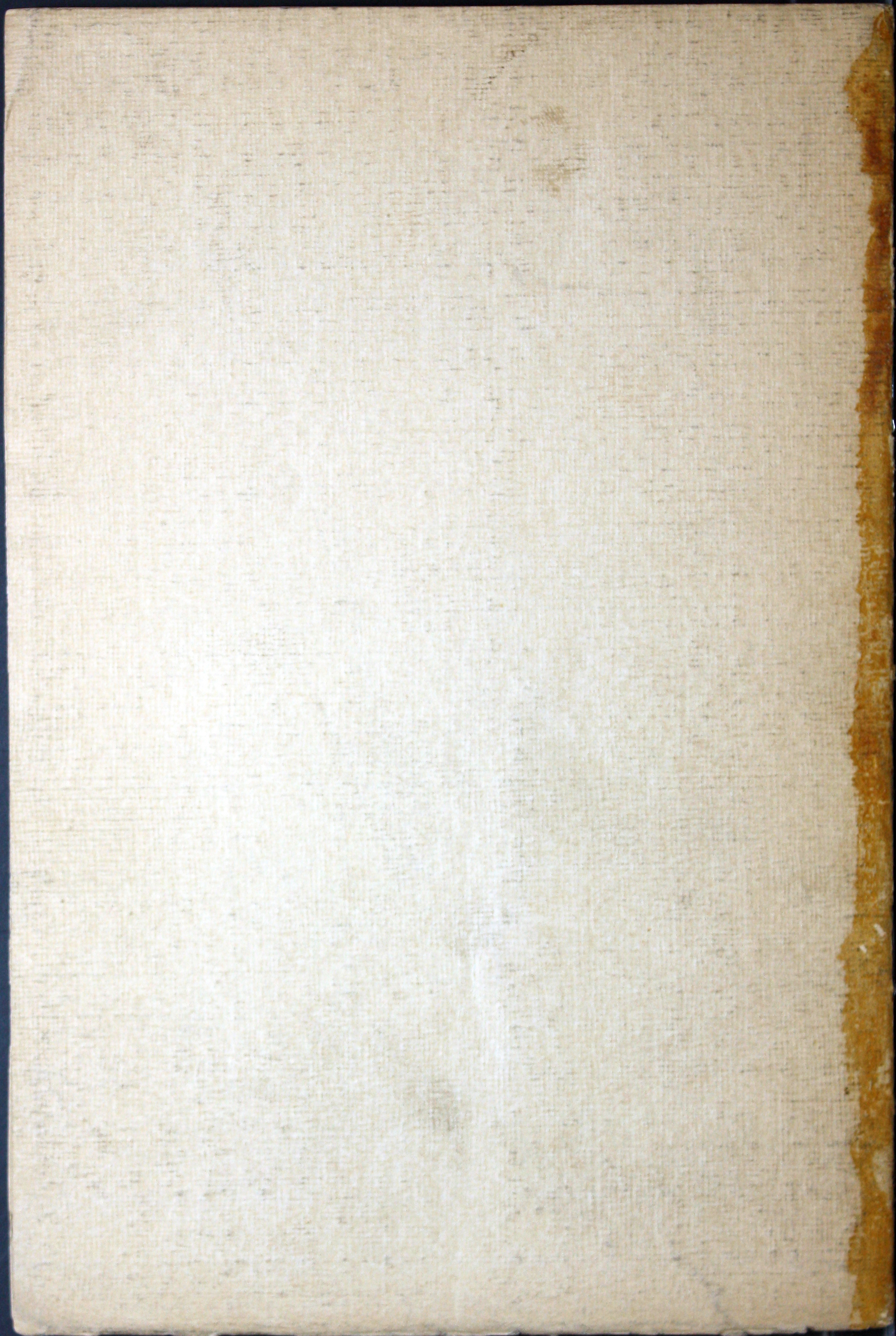
Looking from S. E. at the Main Building in Foreground with South and East End of Gymnasium Showing at Sides.

D. H. BURNHAM & CO.,
Architects.

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